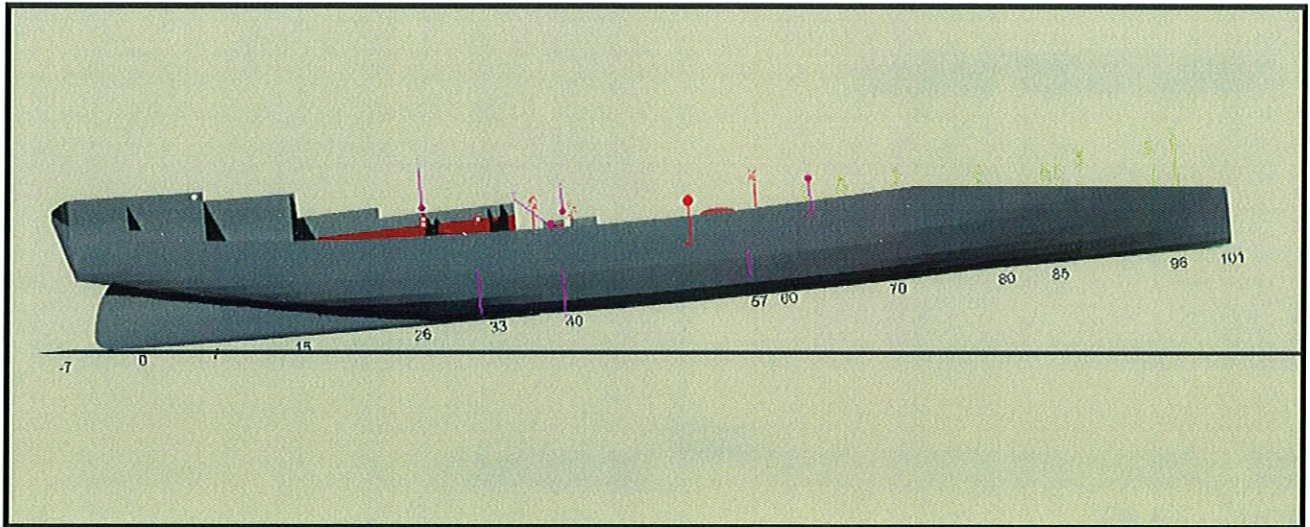




## LIMITED SURVEY REPORT OF THE SS CATALA



*Trim Starboard View of SS Catala*

**Performed For:**

Washington State Department of Ecology

Southwest Regional Office

P.O. Box 47775

Olympia, WA 98504-7775

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## EXECUTIVE SUMMARY

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On May 31 – June 1, 2006, Global Diving & Salvage, Inc. completed a limited survey of the SS Catala for the Washington State Department of Ecology. The findings and results of the survey can be summarized as follows.

- ⤴ A significant amount of heavy oil was found in the Forward Deep Oil Fuel Tank and the No. 1 Oil Fuel Tank.
- ⤴ A significant amount of contaminated sand was found above the No. 1 Oil Fuel Tank and the No. 2 Oil Fuel Tank. It appears as though this contamination was released through open hatches in the tank tops.
- ⤴ Perimeter boring and groundwater samples around the vessel indicate that very little oil has remained localized in the surrounding sediment.
- ⤴ A significant amount of asbestos was found in bulkhead insulation, wiring harnesses, and terrazzo flooring aboard the vessel at various locations.
- ⤴ A computer generated 3-dimensional model was created from what can be observed of the vessel and used to overlay tidal information as well as the findings of this report.
- ⤴ The estimated tank capacities of the various Oil Fuel Tanks on board are as follows:

Fwd Deep O.F. Tank:	5,984 - 6,358 gal (800-850 cu ft)
No.1 O.F. Tank:	14,961 - 22,442 gal (2,000-3,000 cu ft)
No.2 O.F. Tank:	8,977 - 13,465 gal (1,200-1,800 cu ft)
No.3 O.F. Tank:	7,481 - 11,221 gal (1,000-1,500 cu ft)
No.4 O.F. Tank:	3,740 - 5,984 gal (500-800 cu ft)

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## 1.0 INTRODUCTION

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On May 31 – June 1, 2006, Global Diving & Salvage, Inc. completed a limited survey of the remains of the SS Catala located at Damon Point in Ocean Shores, Washington.

The scope of services included the following.

1. Determine the condition of what remains of the hull of the vessel.
2. Determine the quantity and quality of the oil remaining on board within the limits of working above the MLLW mark (Fwd. Deep Oil Fuel Tank, No. 1 Oil Fuel Tank, and No. 2 Oil Fuel Tank).
3. Determine the quantity of any seepage of heavy oils from the hull of the vessel into the outlying environment.
4. Determine the potential for contamination of sediment within the hull of the vessel from unsecured tankage
5. Determine the extent of the asbestos remaining on board.
6. Generate a 3-dimensional model of the vessel for visual reference and planning purposes.
7. Compile the findings of the survey into a detailed report.
8. Provide recommendations for options to remediate, remove, or encapsulate the contaminants or the hull itself along with the commercial considerations associated with these options.

This report summarizes the findings of this survey and provides documentation on the observed conditions in the form of photo documentation, test results, and electronic solid edge modeling. This operable electronic model will assist in analysis of the situation and in remediation scoping and operational planning.

## 2.0 METHODOLOGY

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### 2.1 PERSONNEL

The project was carried out under the direction of Jim Sachet of the Washington State Department of Ecology. The on scene survey was performed by an experienced team composed of the following personnel.

D. Grennan	-Asbestos and Boring Supervisor, Field Technician
D. DeVilbiss	-Product Investigation Supervisor, Field Technician
E. Cheeka	-Field Technician
J. Eyler	-Equipment Operator, Field Technician
R. Roe	- Soil Boring Supervisor
K. Vandehey	-Drill Operator, Soil Boring Technician
B. Stubb	-Soil Boring Technician
A. Gooden	-Naval Architect, Model Technician
J. Kosoff	-Asbestos Monitor

Environmental Associates, Inc. worked under the direction of Global Diving to collect the soil and groundwater boring samples from in and around the vessel. Walker Specialty Construction, Inc. worked under the direction of Global Diving to monitor the survey operations to ensure personnel safety and to collect samples of possible asbestos contaminating material. The Glostien Associates, Inc. worked under the direction of Global Diving to generate the electronic model.

### 2.2 INSPECTION AND SURVEY TECHNIQUES

#### 2.21 PRODUCT INVESTIGATION

An investigation into the cargo onboard the vessel was performed by qualified personnel. Field technician's tools included a John Deere 80 excavator, various hand tools, magnetic base and hand drills, tapping tools, probes, sampling jars, and sealing hardware. The tank tops were cleared of sand and debris in chosen locations. A 27/64" hole was then drilled into the tank tops. After probing to see the contents of the tanks, the hole was tapped for 3/8" NCT and a bolt with a sealing washer was installed to seal the hole. The hole can then be accessed in the future if needed. These steps were performed systematically while working down the port side from the bow towards the stern. Two open hatches have been discovered in the area of the desired sampling locations (Forward Deep Oil Fuel Tank, port side and No. 1 Oil Fuel Tank, port side). As the work progressed toward the stern, increased amounts of sand and water over the work area complicated the information gathering process. Where water was held inside of the hull, a sump was dug below the level of the desired sample location so the water could be removed while the work was performed. This method worked well until trying to access the top of No. 2 Oil Fuel Tank. At this

point the angle of repose for the wet sand would not allow the excavator to reach far enough to dig a deep enough hole to act a sump for the area of intended sampling.

If product was found under a sampling location, samples of the product were taken to determine the amount of contamination of sand and debris on that location of the tank. After samples were taken down the port side as far as possible with the equipment on hand, a sample was taken 12" to starboard side of centerline on the Forward Deep Oil Fuel Tank. This location was chosen to help determine the amount of oil or water in the tank as it was at a lower elevation than of any of the locations on the port side of that tank. No other sample holes were created on the starboard side of centerline due to the time frame available and the increased effort to do so farther aft on the vessel.

Observations and measurements by the survey crew were immediately recorded in the field notes. Samples were collected and stored for possible evaluation. Results were then summarized in this report and provided in Section 3.0 Observed Conditions and Results.

## **2.22 SOIL BORING AND GROUNDWATER INVESTIGATION**

The sampling investigation centered around 12 borings near the perimeter of the vessel to determine possible sediment and groundwater contamination outside the hull.

Borings were completed with the use of a tractor mounted Strataprobe limited access drilling rig. Borings were completed to varying depths between 8 to 20 feet below the ground surface. Due to the attitude of the vessel as it currently lies, the depths were generally shallower near the bow and deeper as borings went aft. Borings were taken within 4' of the vessel's sideshell.

A 1" diameter soil sampling tube was advanced into the ground in 4 foot increments, and then brought to the surface where it was examined, sampled, and logged accordingly. Each recovered soil sample was also field screened to attempt to measure the concentration of volatile organic compounds with a photo ionization detector.

In addition, groundwater samples were taken from the 12 perimeter borings for analysis. A temporary well screen was inserted into the Strataprobe to the desired depth, and a peristaltic pump was used to recover groundwater and pump it directly into laboratory prepared glassware.

Five sediment samples were collected from the various undisturbed overburden sands accumulated on top of the vessel.

Five sediment samples were taken from selected locations within the vessel's hull and above both the No. 1 Oil Fuel Tank and No. 2 Oil Fuel Tank, where there were noticeable traces of bunker oil odor and texture.

Finally, a sample was taken from the water draining from the hull on the port side amidships.

Results of both soil boring and groundwater investigation are summarized in this report and provided in Section 3.0 Observed Conditions and Results. The full report provided by Environmental Associates, Inc. is provided in Appendix A.

## **2.23 ASBESTOS INVESTIGATION**

Various source samples were collected on May 31, 2006 by a certified asbestos inspector throughout the vessel. The sampling was limited by what was exposed and accessible, and can only refer to what was available for sampling. It is believed that what was observed at the exposed locations of the vessel will most likely be consistent throughout the vessel, including areas currently covered with sediment.

Twenty nine samples were collected, focusing primarily on known suspected materials. These locations were primarily insulation on and around bulkheads, insulation for wiring harnesses, sealants and caulking, and tiling. All suspect materials were collected, bagged and transported for laboratory analysis.

Results of asbestos sampling are summarized in this report and provided in Section 3.0 Observed Conditions and Results. The full report provided by Walker Specialty Construction, Inc. is provided in Appendix B.

## **2.24 COMPUTER MODELING GENERATION**

Computer modeling efforts were performed by a qualified naval architect. Information was gathered from magazine articles and local knowledge. This was coupled with era specific lines of similar vessels to begin the computer model. As work was being performed during the limited survey, data was collected on scene by the naval architect and entered into the model. Tools used in this effort were tape measures, digital cameras, laptop computers, and observations as certain parts of the vessel were uncovered in the sampling efforts.

Results of the information gathered for the computer model are summarized in Section 3.0 Observed Conditions and Results, and electronic “snapshots” accompany this report in Appendix C.

## 3.0 OBSERVED CONDITIONS AND RESULTS

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Results of the limited survey are compiled in this section. They are broken out as follows:

- ▲ Product Investigation Results
- ▲ Soil Boring and Groundwater Results
- ▲ Asbestos Results
- ▲ Computer Modeling Results

### 3.1 PRODUCT INVESTIGATION RESULTS

A synopsis of the product investigation results follows:

The Forward Deep Oil Fuel Tank appears to be mostly full of product. Sand and other contaminants have entered the open 10" hatch that is located on the port side and become mixed in the product at that location. Samples taken below this point seem to contain few contaminants. No significant amount of product was observed in the sand above this tank.

No. 1 Oil Fuel Tank appears to be mostly full of liquid. Samples taken on the port side indicate that a significant portion of that liquid is product. There is an open 10" hatch in the port aft corner of the tank. The sediment above the hatch was heavily contaminated. In addition, contents in the tank were heavily contaminated with sand. The product sampled at the other locations in the tank indicated clean product with few contaminants.

No. 2 Oil Fuel Tank could not be accessed directly due to its burial depth and the water level within the hull. In efforts to do so, a significant amount of product was observed in the 3' of sand above the tank top in the area of the day tanks. Based on the observations of the forward tanks, this seems to indicate that the No. 2 Fuel Oil Tank is open to the area above it. It may be through another 10" open hatch, although this was not confirmed during the survey.

Ease of access to the tank tops was observed throughout the survey. The portions of the tanks that have less than 3' of sand over them, and are at least 5' above MLLW, are relatively easy to access. This only applies to approximately half of the Forward Deep Oil Fuel Tank, and the port side of the No. 1 Oil Fuel Tank. Past these points, the access to the tank tops is more difficult to achieve in a direct ratio to depth of sand and elevation with relation to MLLW.

Observed conditions at each sampling location are listed in the table below.

SAMPLING LOCATION DESIGNATION	SAMPLING LOCATION (all locations on top of fuel tanks)	RESULTS
#1	Within 16" of Port side shell between frames #96 and #97. On top of Forward Deep Oil Fuel Tank.	10" open hatch. Has lockable patch installed. Product with sand and debris mixed in. Product level 14" below tank top
#2	Within 12" of Port side shell between frames #88 and #89. On top of Forward Deep Oil Fuel Tank.	3/8" hole. Fairly clean product with slight pressure behind it.
#3	Within 12" of Port side shell between frames #86 and #87. On top of No. 1 Oil Fuel Tank.	3/8" hole. Fairly clean product 8" below tank top.
#4	Within 8" of Port side shell between frames #85 and #86. Just forward of bulkhead between the cargo hold and the refrigeration hold.	4" vent. No product between vent and side shell. Vent sealed with plumbers plug after observation.
#5	Within 24" of side shell between frames #79 and #80. On top of No. 1 Oil Fuel Tank.	3/8" hole. Fairly clean product 8" below tank top.
#6	Within 24" of side shell between frames #71 and #72. On top of No. 1 Oil Fuel Tank.	3/8" hole. Fairly clean product at tank top with some pressure behind it.
#7	Within 24" of Port side shell between frames #66 and #67. On top of No. 1 Oil Fuel Tank.	Fairly clean product at top of tank with significant pressure behind it. Sand on top of location containing product.
#8	Within 24" of Port side shell between frames #63 and #64. On top of No. 1 Oil Fuel Tank.	10" open hatch. The content of tank at this location is sand heavily saturated with product. Material on top of location is sand heavily saturated with product for 2' above tank top.
#9	8" starboard of centerline between frames #88 and #89.	3/8" hole. Fairly clean product with significant pressure behind it.
Attempt #10	On top of No. 2 Oil Fuel Tank between frames #43 and #44.	Tank top was never accessed due to amount of water over the top and the inability to remove it at the time. 3' of sand over the tank top permeated with product.

### 3.2 SOILING BORING AND GROUNDWATER RESULTS

Laboratory analysis of the various soil and groundwater samples can be summarized as follows:

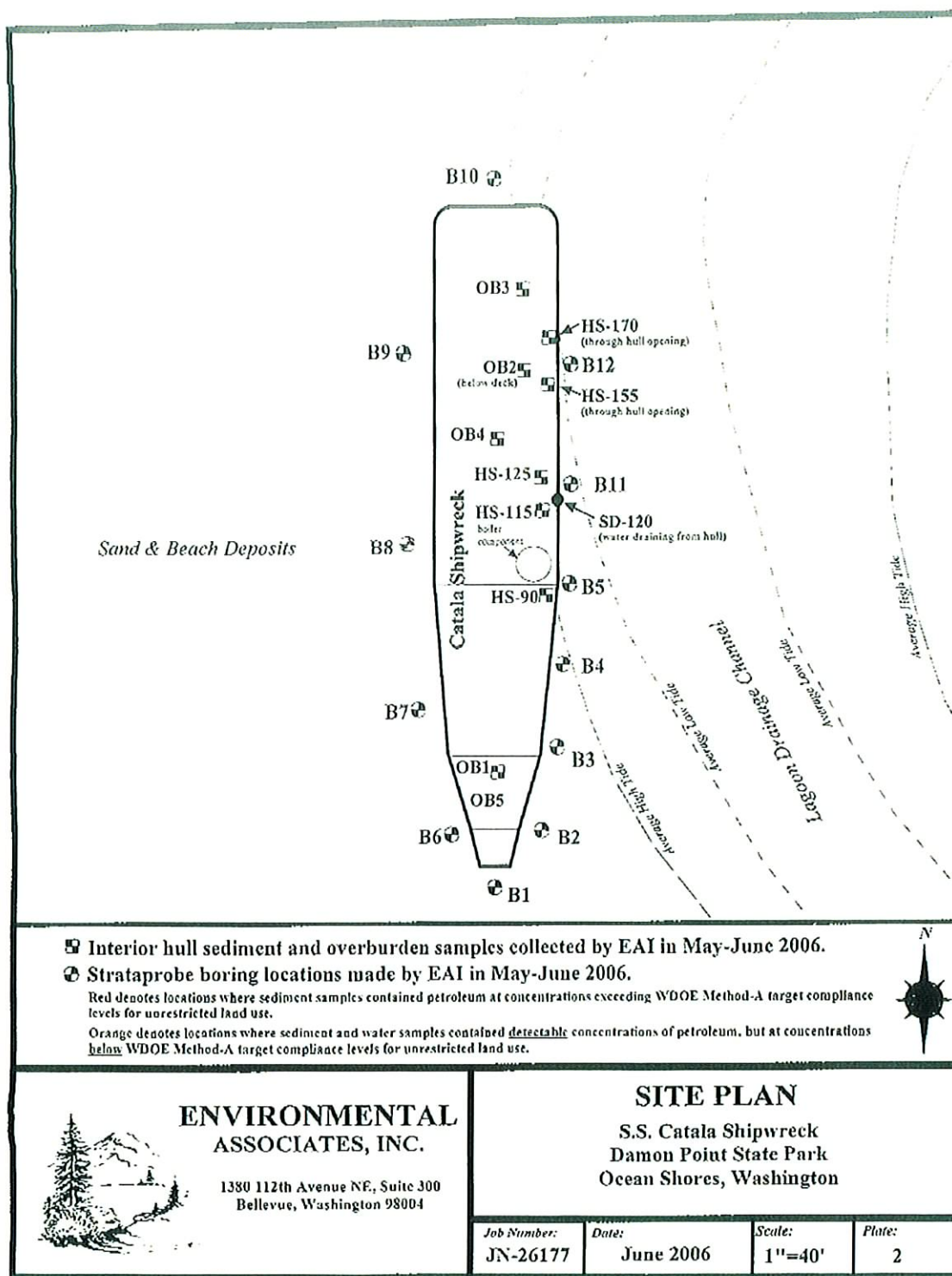
Of the twelve perimeter boring core samples that were taken, most did not appear contaminated, nor exhibit residual tar like texture or pronounced bunker oil odor. Eleven of the boring locations all resulted in < 50 ppm. However, one sample (B8 @ 11-12') resulted in 260 ppm; well below the target compliance level for Washington State Department of Ecology MTCA Method A (2,000 ppm). It is possible that this location at one time was exposed to uncontrolled release from the vessel. An interesting note is that the location is on the starboard side of the vessel amidships.

Of the twelve perimeter groundwater samples taken, eleven of the samples resulted in < 250 ppb. However, one sample (B8) resulted in 420 ppb; again, below the target compliance level (500 ppb). It is the corresponding groundwater sample from the above boring location on the starboard side of the vessel.

As expected, the five undisturbed overburden samples all resulted in < 50 ppm. These were taken primarily to ensure that clean sediment and sand could be stockpiled during the remediation phase of the project and be redistributed upon completion.

The five sediment samples taken from within the vessel's hull resulted in mixed results. The sediment sample taken directly above No. 1 Fuel Oil Tank (HS-90) resulted in 95,000 ppm, above target compliance levels. Correspondingly, two sediment samples taken directly above No. 2 Fuel Oil Tank (HS-115 and HS-125) resulted in elevated contamination ranges (6,100 ppm and 18,000 ppm, respectively), but lower than over No. 1 Fuel Oil Tank. However, two sediment samples taken within the cut-out portion of the vessel's port side further aft both resulted in < 50 ppm.

Finally, the groundwater sample taken from the water draining from the vessel's hull near amidships (port side) resulted in < 250 ppb.



For the thorough summary of the soil boring and groundwater results, please refer to Appendix A.

### 3.3 ASBESTOS RESULTS

Laboratory analysis of the various asbestos sampling results is as follows:

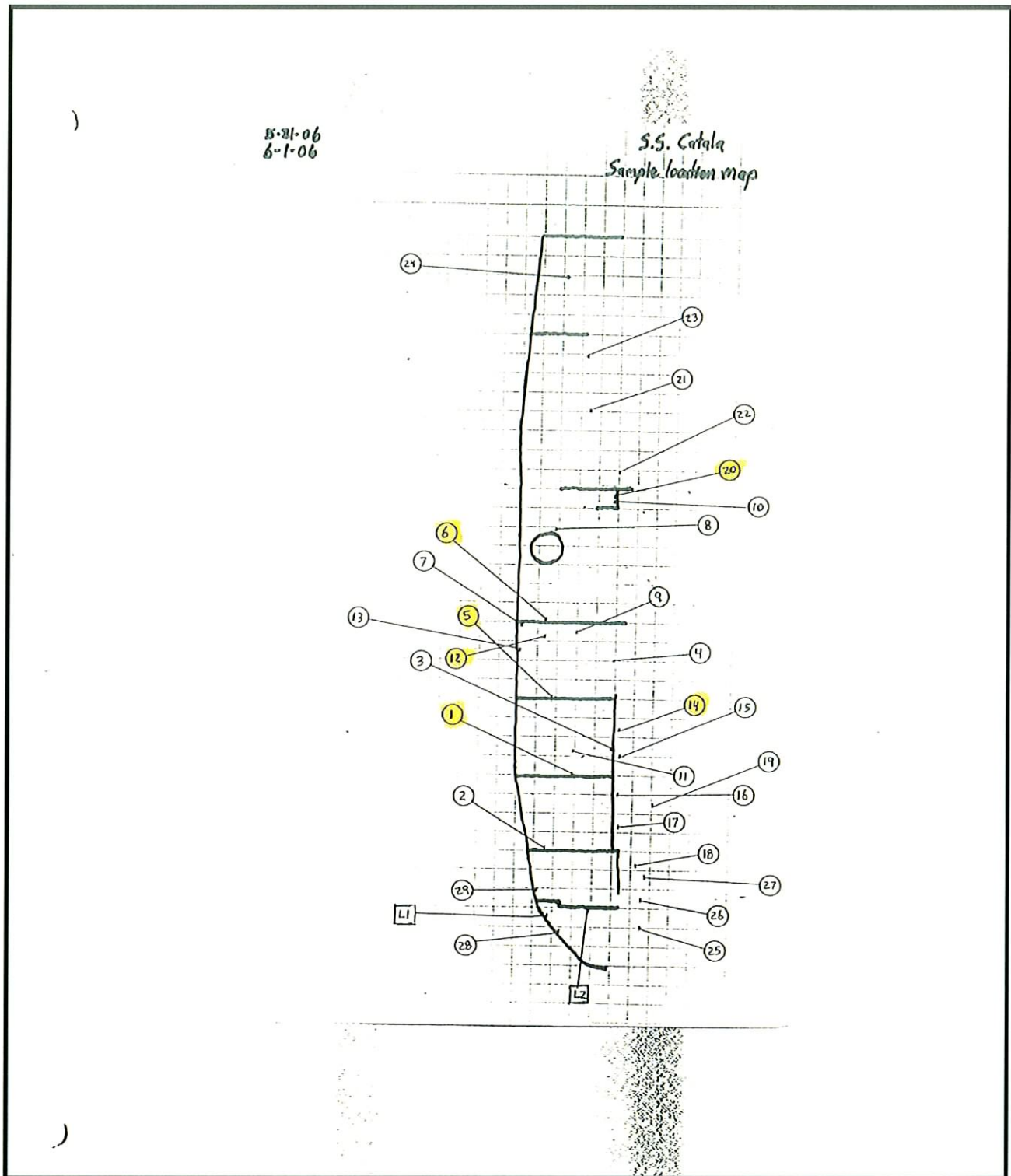
The highest concentrations of asbestos containing material (ACM) were located on the insulated cement board on the bulkheads that were exposed. The various layers of the material contained 25% chrysotile to 45% amosite. Only one sample (JK-1) was submitted for analysis, but two other samples (JK-5 and JK-6) of the same material were collected at other bulkheads, which leads to the assumption that assorted bulkheads exposed and ones currently under sediment within the hull are likely to contained significant ACM.

Various tiling and sheeting on vessel structure floor and bulkheads exhibited ACM with 2% chrysotile, specifically JK-12 and JK-20.

A tar like coating exhibited 2% chrysotile at JK-14.

At various locations where a cement/concrete material was found (JK-7, JK-8, and JK-9), laboratory results found less than 1% anthophyllite used as a binder/filler material.

However, the majority of samples taken found no detectable asbestos fibers. Most of these materials appeared to be caulking, mastic and paint types. Due to the degradation of the materials onboard, a consistent determination on whether ACM exists throughout the vessel is difficult to determine.



For the thorough summary of the asbestos sampling results, please refer to Appendix B.

### 3.4 COMPUTER MODELING RESULTS

Appendix C provides different views of the model of the vessel. This model exists in electronic format that can be manipulated to provide different views. It can also have different layers added to import information such as tide information and sediment overburden. Importing the tide information into the model will allow the users to see exactly which part of the vessel will be above waterline at any given tide elevation. This model can be used to collect information as it is gathered, and modified as work is being done to represent current status. Versions of the model can be saved in chronological order to serve as an archive of the work that has been done.

Based on the model information and lines taken from era specific vessels, the estimated tank capacities of the Oil Fuel Tanks are:

Fwd Deep O.F. Tank:	5,984 - 6,358 gal (800-850 cu ft)
No.1 O.F. Tank:	14,961 - 22,442 gal (2,000-3,000 cu ft)
No.2 O.F. Tank:	8,977 - 13,465 gal (1,200-1,800 cu ft)
No.3 O.F. Tank:	7,481 - 11,221 gal (1,000-1,500 cu ft)
No.4 O.F. Tank:	3,740 - 5,984 gal (500-800 cu ft)

Based on the model information and structural information taken from era specific vessels, the estimated weight of the vessel's steel structure is 231 short tons. The estimated weight of possible machinery left onboard is 56 short tons.

## 4.0 REMEDIATION OPTIONS

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This section is broken out into the various components of the options that may be required to remediate the contaminants on the beach. These options are theoretical and are contingent upon regulatory restrictions, permitting, and the cooperation of the agencies involved. These components will have to be performed in the proper order and sometimes concurrently to facilitate the safety and efficiency of the job. Due to the time frame involved, it may be desirable to work on several sections of the vessel at once. A final work plan would be provided before work begins.

Factors which will affect the difficulty and cost of the project are:

- ✧ Location of vessel within an endangered species nesting ground.
- ✧ Location of vessel within a public state park with the likelihood the remediation phase will become an attractive nuisance to the public.
- ✧ Location of vessel in intertidal zone. Ninety percent of the fuel tanks are below the MHHW elevation.
- ✧ Location of the vessel next to a channel that drains and fills the lagoon on Damon Point peninsula, and the undercutting of the vessel that results from this.
- ✧ Limited access to the site over a primitive road that is in need of clearing.
- ✧ Specific gravity and viscosity of the product on board. The temperature of the product will have to be raised to a certain level in order to be properly moved.
- ✧ There exists a mixture of material ranging from sand to pure product throughout the vessel in different locations. The different ratios of mixture will have to be dealt with using different methods.
- ✧ The vessel is impacted and buried in sand.
- ✧ Certain components of the vessel contain various levels of asbestos.
- ✧ Structural integrity of the vessel and tankage is not known, and probably will not be known until after work has begun.
- ✧ The nature of the work falls under hazardous materials response, confined space, and trenching operations and must be performed under the safety restrictions that accompany these operations.

### 4.1 CASUALTY CONTAINMENT

The location of the vessel in the intertidal zone and environmentally sensitive area, and the type of work required to accomplish the goals will require that the vessel is contained in an area where the water and materials entering and leaving the area can be controlled. The following options have been researched:

- ✧ Oil and silt booms

- ▲ Berming the small channel between the lagoon and the ocean
- ▲ Sheet pile wall

Oil and silt booms could be utilized to help contain the contaminants inside the work area. While the use of booms or at least the availability of such resources will be crucial as a part of the overall plan, they have been deemed inappropriate to serve as the initial containment. They will not control the amount of water entering and leaving the work area. With no control over the tide cycle on the vessel, work performed at low tides would have to be abandoned and sealed in preparation for the incoming tide to flood the area.

Berming the small channel between the lagoon and Grays Harbor is a potential option. This is deemed unsuitable due to the amount of material that would have to be either imported to the area, or moved from a different section of the beach. The work area would still be subject to storm and tide surges should water be pushed into the lagoon from the offshore side of the spit. Berming this section would also create a “dead water” space in the lagoon potentially endangering the wildlife dependant on this tidal exchange.

The installation of a sheet pile wall is deemed the most attractive option in containing the vessel. Sheet pile would be installed around the stern, down the port side, and around the bow. The starboard side would not be within the sheet pile wall to help facilitate access from the North side. Once the sheet pile wall was installed, a sump could be set up to keep the vessel side of the wall dewatered. The water being removed from this area could be run through large decanting tanks before being discharged back into Grays Harbor.

Based on the information at this time, we believe that 40' sheets would be long enough to affect a seal and the ability to dewater the inside of the wall. A whaler would be installed to tie the sheets together enough to hold the weight of the water and mud as the inside of the wall was dewatered and excavated. This whaler would be a large I-beam that would be fixed to the wall horizontally.

The wall would be installed approximately 6 feet outboard of the side shell of the vessel in order to allow access to create sumps and access to the side to the vessel. A lay down area next to the vessel would be needed to stage work equipment. A large crane would be used to drive the sheets into the sand using a vibratory hammer. Each sheet would be installed in pairs and threaded together using interlocking joints. The whaler would be installed after the piles were driven to final elevation. The elevation of the top of the piling would be such that they would remain above the highest possible tide level coupled along with potential local swell and wind wave conditions.

Once the sheet pile wall was installed, the crane could be continued to be utilized to assist in the continued efforts of remediation and removal.

## **4.2 UNDISTURBED OVERBURDEN REMOVAL**

To facilitate access to the structure of the vessel, the undisturbed overburden primarily residing from approximately amidships to the stern of the vessel (above the steel structure line) would be removed with a large bucket excavator and stockpiled near the casualty site. Based on preliminary sampling results, this material could be reused at a later date. To ensure clean material was stockpiled, field screening techniques and monitoring would be utilized. The overburden needs to be removed to expose the potentially contaminated sediment within the hull and structure of the vessel. If warranted and allowable, continued removal of uncontaminated sediment within the

structure (above decking) of the vessel would further reduce potential disposal costs. Based on a general estimate, approximately 1,600 cubic yards of sediment reside on top and within the SS Catala.

#### **4.3 CONTAMINATED SEDIMENT REMOVAL**

Contaminated sediment removal within the structure of the vessel could be accomplished with both heavy equipment such as an excavator with varied bucket sizes and air movers suited for hydro excavation removal. These two removal operations would facilitate expedited removal as well as limiting exposure to friable asbestos within the vessel's structure. The air movers could remove sediment in areas where the bucket of an excavator cannot reach or effectively remove sediment due to the varied edges of the vessel.

Contaminated sediment removed via excavator could either be stockpiled onsite in an area with an impermeable lining, or dumped directly into trucks for transportation to an offsite disposal location.

Contaminated sediment removed via air movers could be pumped into vacuum boxes for separation and eventual transportation and disposal.

All contaminated sediment would need to be properly disposed of, or alternate means for disposal could be considered.

#### **4.4 ASBESTOS REMOVAL**

The type, quantity and location of asbestos containing materials (ACM) provide for limited options for abatement:

- ▲ Encapsulation
- ▲ Manual removal without encapsulation

Before a thorough description is made about the above two options, it is important to note that regardless of the method employed, a variance would be required from either WISHA or OSHA (depending on jurisdiction) for alternative abatement means, and a variance from the appropriate air quality enforcement agency (state or federal) for the human health exposure potential. These two issues have not been fully researched, as the project approach will drive the potential abatement method which will then need to be approved.

Total encapsulation is an unattractive and potentially impossible option due to the vessel's current condition in regards to weather and water exposure. In addition the sediment within the vessel's hull limits access to other areas of the vessel where ACM is likely to exist.

Manual removal of ACM while the material is exposed is the preferred option. ACM currently exposed and available for abatement should be removed. After the overburden and contaminated sediment is removed, and thereby exposing the vessel's structure, further ACM abatement should continue to reduce the human health and environmental risk. All abatement operations would have to be performed by a certified asbestos abatement company.

All ACM would be properly transported and disposed of.

## 4.5 PRODUCT REMOVAL

With regard to the removal of the product on board, the following options have been researched.

- ▲ Removing the hull with the oil in place
- ▲ Removing the oil in-situ while cold
- ▲ Removing the oil in-situ using heat

Removing the oil while still in the vessel has been deemed to be an unattractive option. The size of the vessel would require that the hull be cut into pieces in order to be able to be lifted by a mobile crane. The tanks run back to back for most of the length of the vessel. This does not allow the tanks to be cut into pieces without opening a tank to the environment. The product could be cooled using liquid nitrogen to a point that would guarantee that it stays in place, however the cost of the cooling and the wire sawing methods required deems the option impractical.

Removing the product in-situ has been determined to be the best method. This will require access to the top of the tanks. The Forward Deep Fuel Oil Tank will be able to be accessed fairly easily through excavation of the sand, however, the other tanks on the vessel will need to have the portions of the vessel's structure on top of the tanks removed as well as excavating the sand. This will need to be done in concert with the asbestos removal. Much of this work, and the work behind the sheet pile wall, will fall under trenching operations and would have to be dealt with as such.

Removing the oil in-situ without heating the oil would require the tops of the tank being removed mechanically so that access could be gained to the entire tank. The product could then be either pumped or scooped out of the holds. This method would expose large amounts of product to the environment at one time. This method may be necessary if tanks are found to be holed in the side shell; however remains a secondary option to removing the product using heat.

In order to be able to pump the product, it will have to be heated to a level that it becomes quite fluid. It would be feasible to pump some product without heating it; however the lack of flow to the pump would only allow the pumping to remove the oil in the area of access only. In order to be able to pump the entire tank full of product from the lowest point, the entire tank needs to be brought up to a flowable temperature. This would be accomplished using heat exchangers that would be inserted into the tank through access holes that steam would be pumped through. The steam would be generated using portable boilers. The heated oil would then be pumped to a different part of the tank and re-circulated until the entire tank is up to temperature. Once the tank is to a sufficient temperature, the oil would be pumped into mobile containers to be transported to offsite locations.

The entire process of the pumping would be sealed and contained so that product would not be released from the tanks until it was ready to pump. Hot tapping procedures would be used to create access holes in the tanks that would be valved to control access.

Once the bulk of the product was removed from the tank, the tank would be cut open enough to allow access for final cleaning. A team of properly trained personnel would enter the tank and steam clean the inside while pumping out the dislodged remnants. This work would fall under confined space working rules, and would be treated as such.

## **4.6 VESSEL REMOVAL**

Portions of the vessel will have to be removed to access the top of the tanks. As mentioned in the discussion regarding asbestos removal, steel structures would need to be exposed and abated, if necessary, prior to sectional removal. Upon the removal of the petroleum products in the various tanks, the rest of the hull could be separated into sections, lifted out onto trucks via mobile crane, and transported off site.

The tools used to cut the metal would range from oxy-fuel torches, mechanical shears, grinding and sawing tools, and excavators with thumbs. Care would be taken to ensure that no oil would be able to ignite during any heat related methods.

## **4.7 SPILL RESPONSE CONTINGENCIES**

Due to the environmental sensitivity of the area, and the estimated type and quantity of bunkers onboard the vessel, emphasis should be placed on best management practices with the various construction, equipment, and pumping operations needed for the remediation phase. To further that aim, the following preparedness steps should be considered in the event of an uncontrolled release of petroleum product:

- ⬆ Limited skimming and recovery resources for anticipated oily discharge within the sheet pile perimeter due to release of oil from sediment or tankage.
- ⬆ Sufficient containment boom staged near prioritized Geographic Response Plans within Grays Harbor.
- ⬆ Sufficient on-water skimming capability staged/moored in the water at marina near Damon Point.

## **4.8 SITE RESTORATION**

Upon completion of the remediation phase of the project, either with the removal of petroleum products in-situ or removal of the entire vessel, the site will have significant impacts from the operations. The casualty containment methodology (sheet pile or berming) would have to be removed. In addition, the vessel would either need to be reburied with clean sand, or the hole where the vessel was would need backfill. Finally, the impacted area (lay down area, equipment storage, etc.) would need to be restored to conditions prior to the remediation phase.

A habitat restoration consultant, working with the affected state and federal agencies, should be used to ensure the habitat is restored to an environmentally friendly state.

## **APPENDIX A**

### **ENVIRONMENTAL ASSOCIATES, INC. SS CATALA REPORT**

## **APPENDIX B**

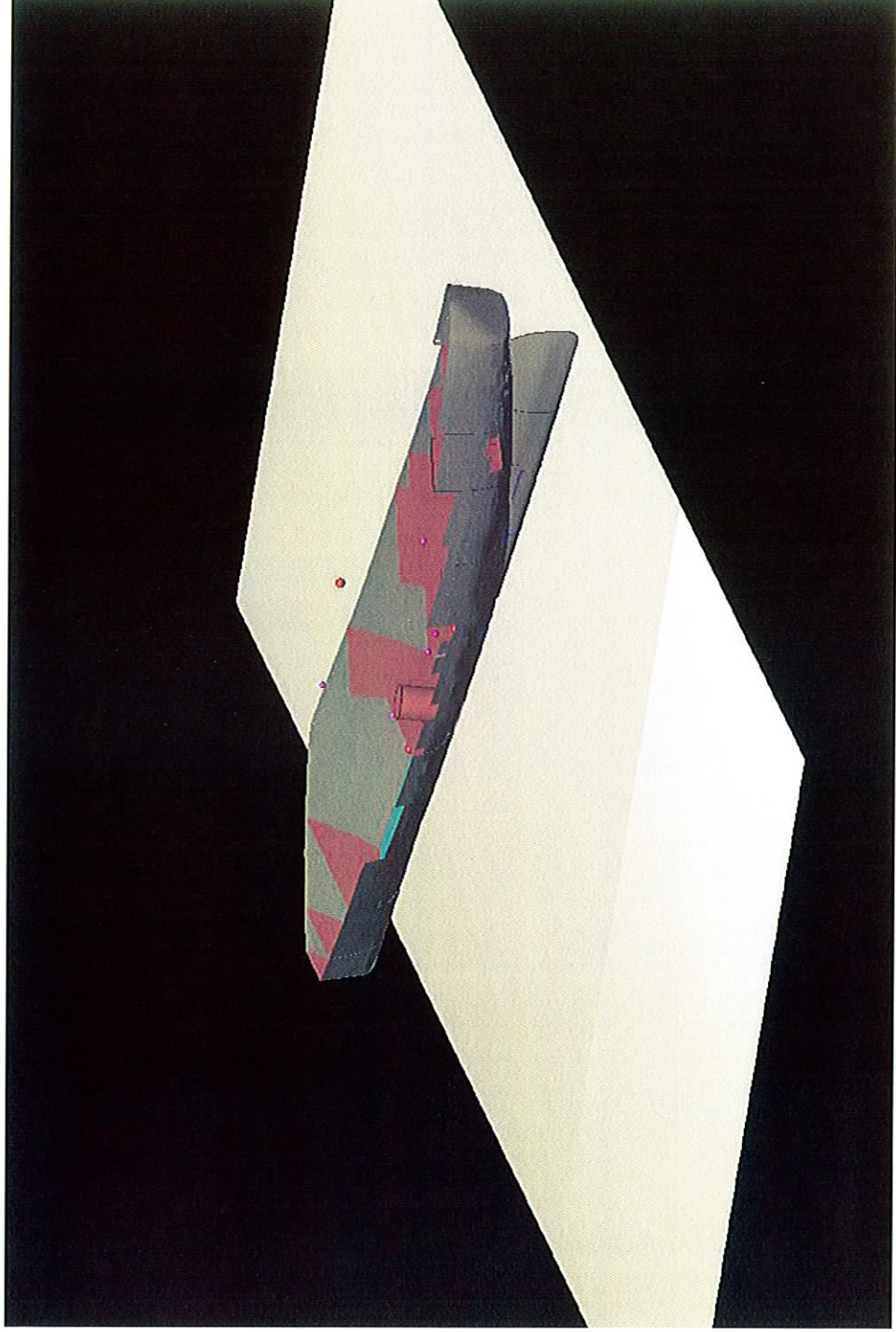
### **WALKER SPECIALTY CONSTRUCTION, INC. SS CATALA REPORT**

## **APPENDIX C**

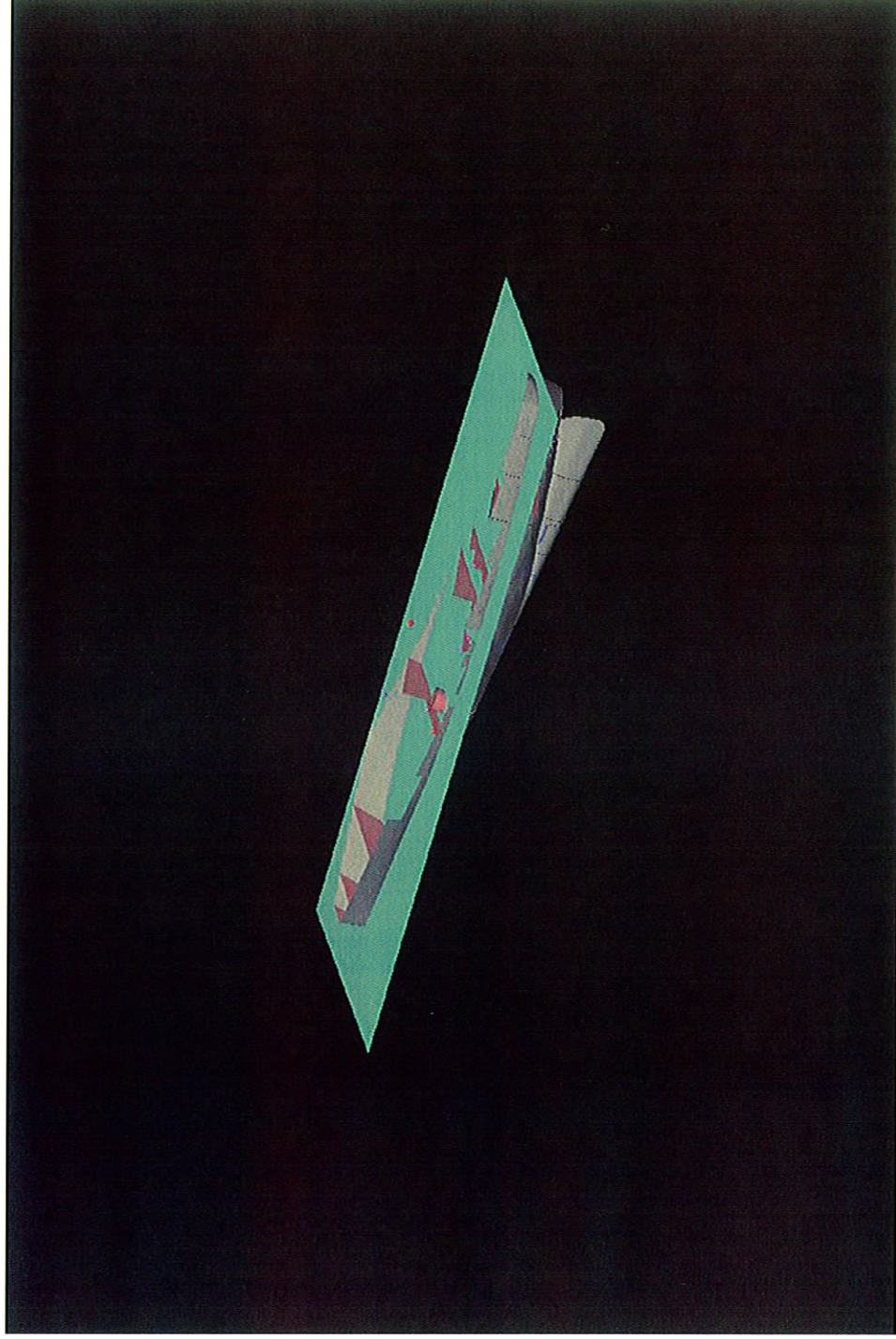
### **THE GLOSTEN ASSOCIATES, INC. ELECTRONIC COPY OF MODEL**



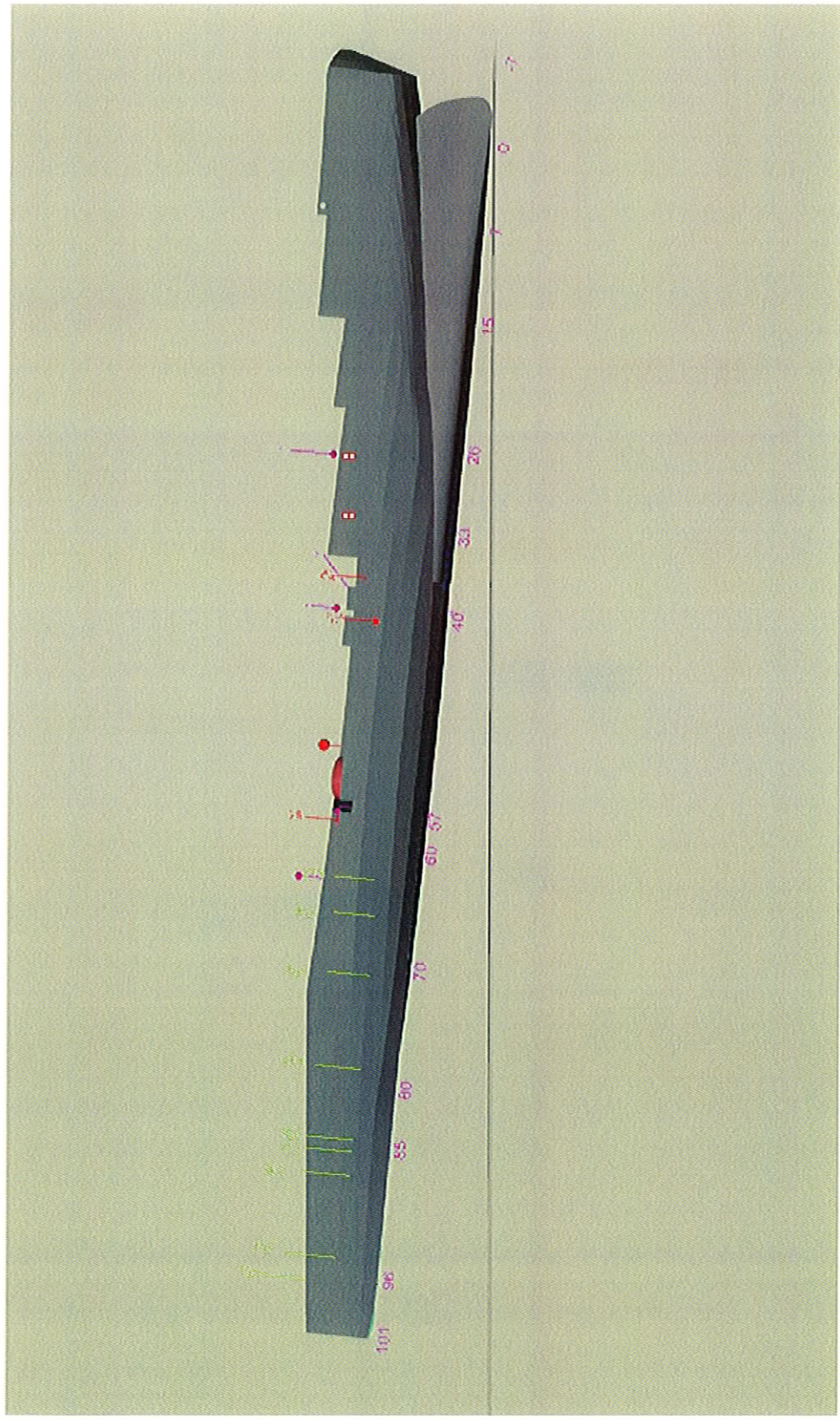
Catala in full



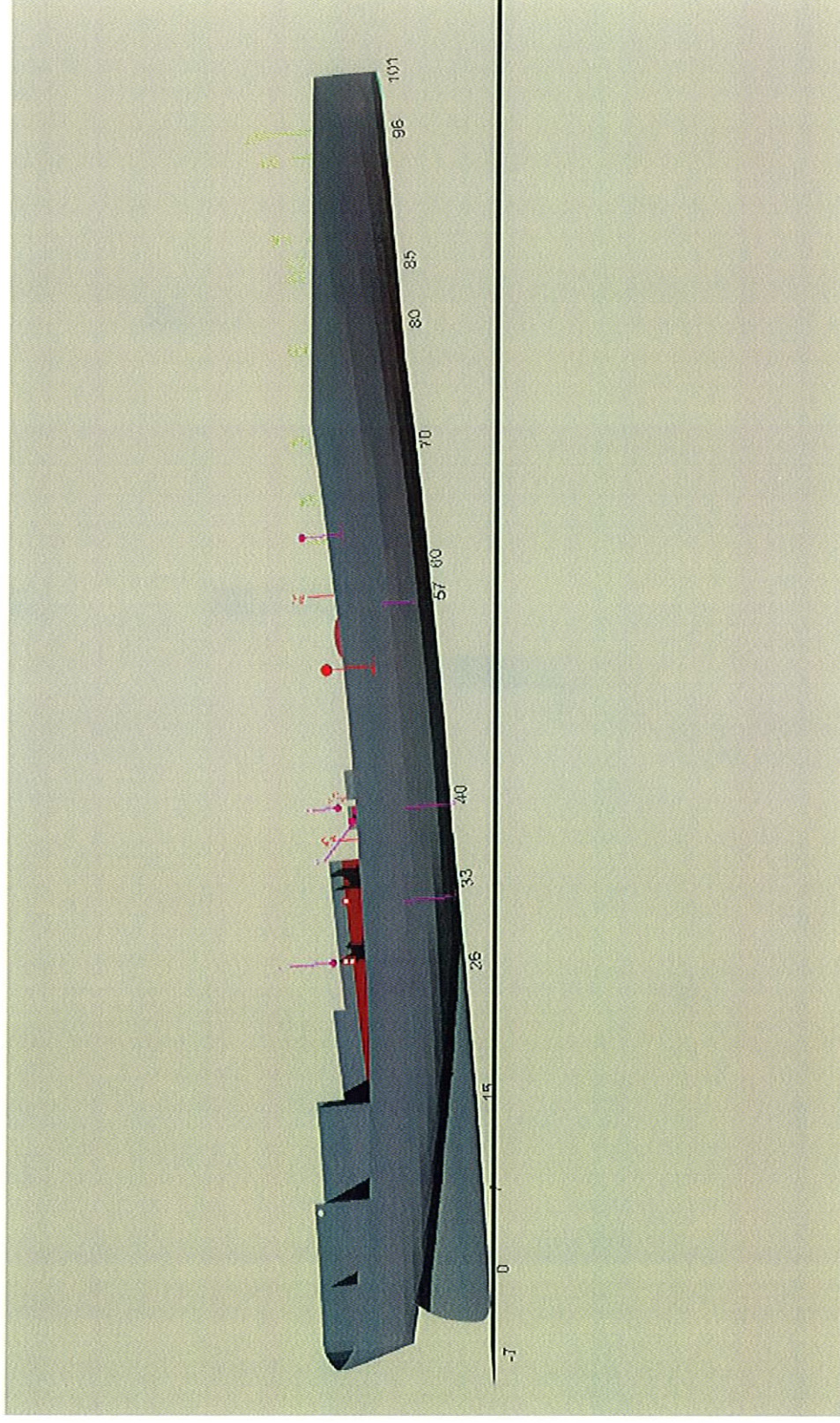
Catala with horizon



Catala with high tide mark

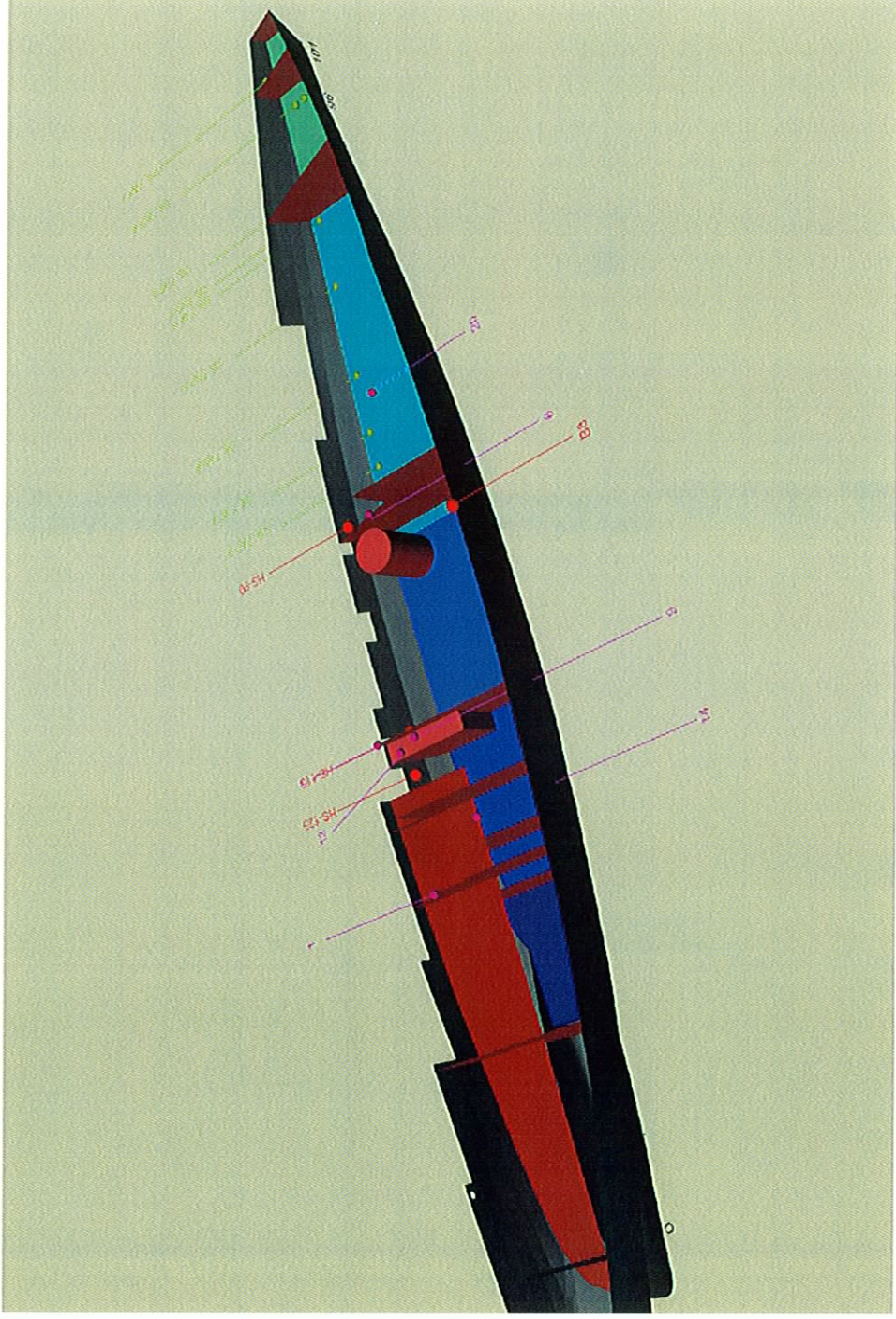


Catala Trim Port

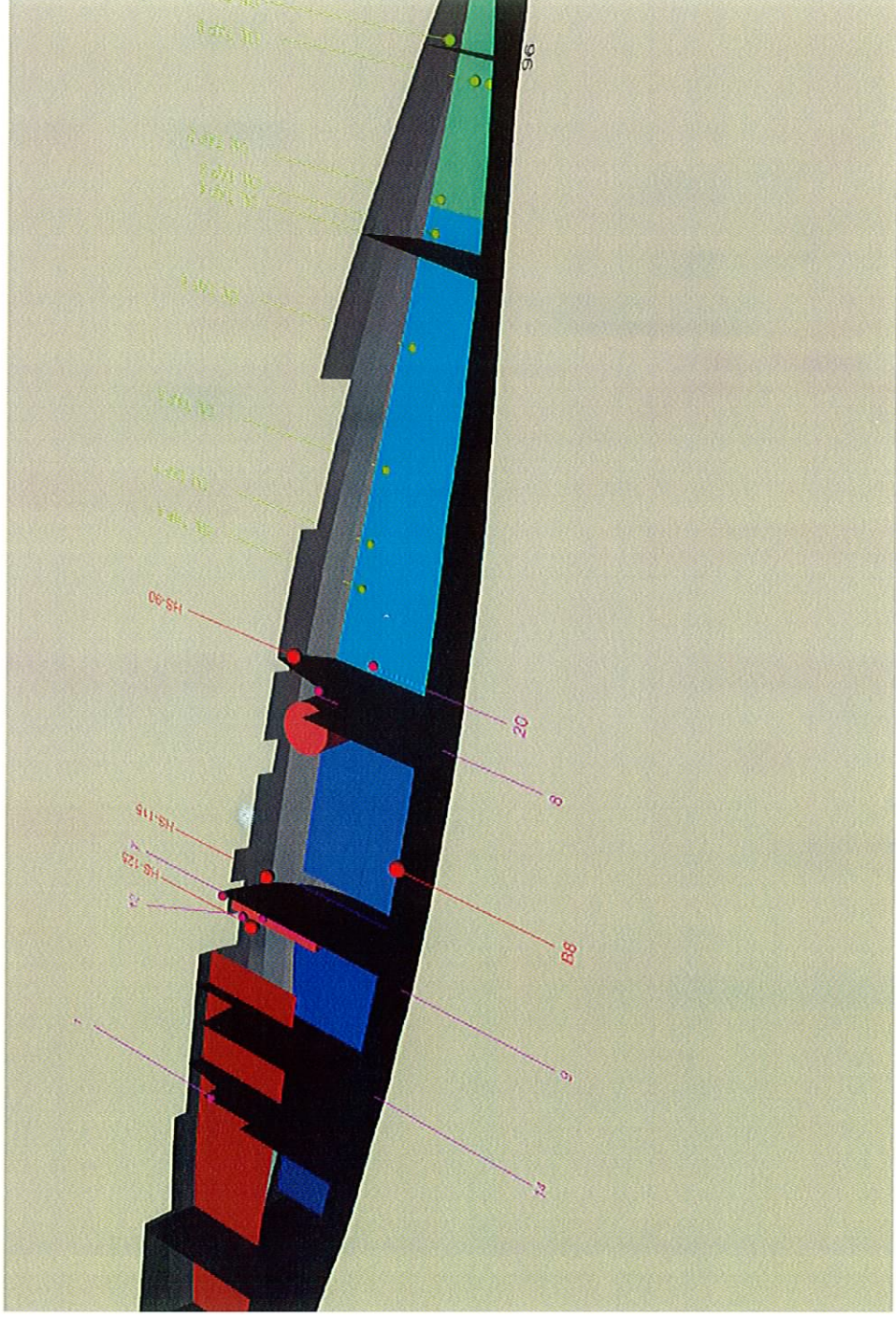


Catalina Trim Starboard

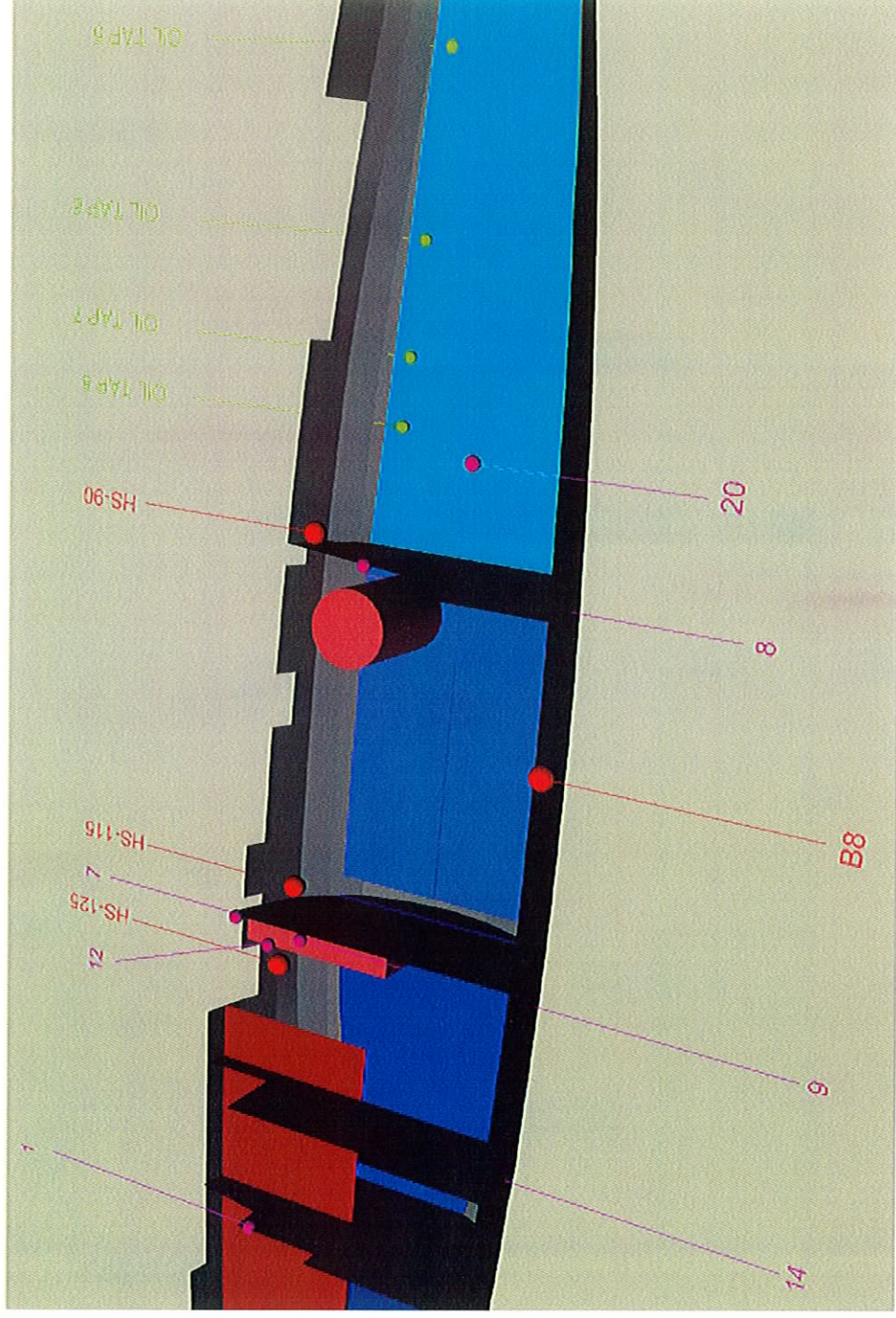




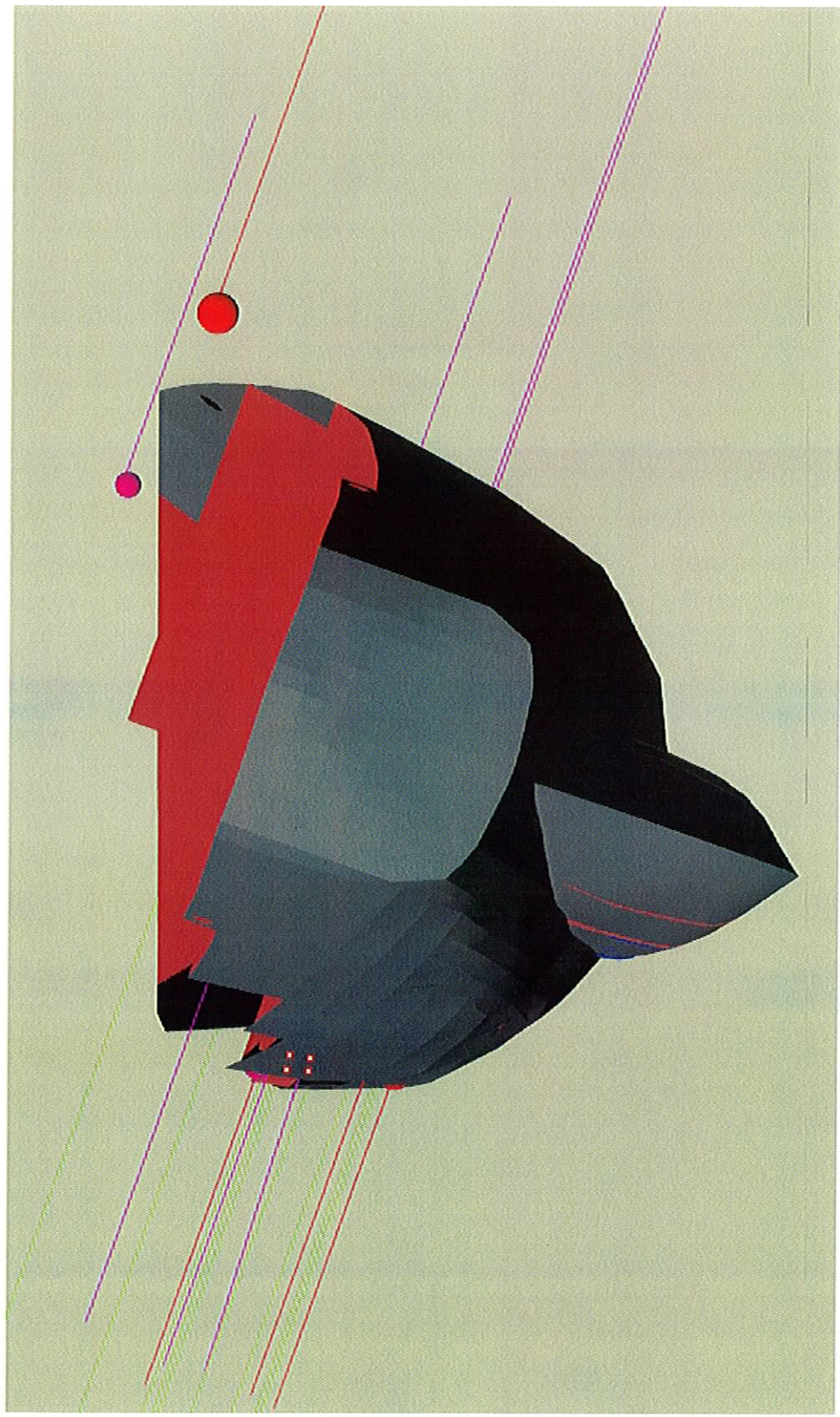
Catalina Starboard Quarter



Catala Sampling View 1



Catala Sampling View 2



## Catala List View